UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS
DIVISION OF AGRICULTURAL ENGINEERING

S. H. McCrory, Chief.

MONTHLY NEWS LETTER

May 20, 1929.

April 26 the Advisory Council, Farm Mechanical Equipment Research Survey, met in Washington. This is the body set up by Secretary Jardine about four years ago to give general direction to the Division's study of the problem of the research needed in the field of mechanical equipment for the farm. In the morning the council held a session at which was discussed the progress made and a future program outlined. In the afternoon the council met Secretary Hyde, who expressed his interest in the movement and agreed to the continuation of the project and of the council's existence. Another meeting of the council is scheduled for the latter part of June in Chicago.

The annual meeting of the Advisory Committee of the College Division, A.S.A.E., met in Washington on February 25-27, 1929. The major part of the program related to research in general and the research program of the Division of Agricultural Engineering, U.S.D.A. The object of each of this Division's 53 projects and sub-projects were stated by Mr. McCrory. The results of the studies of fertilizer distributors, of mechanical control of the European corn borer, and of artificial drying of hay and grain were presented by G. A. Cumings, R. B. Gray, and W.M. Hurst, respectively. Discussion of the structures projects was led for this Division by M.C. Betts. A review of extension work in agricultural engineering was presented by L. A. Jones.

Research was defined as "the earnest, purposeful, persistent, and intelligently directed effort to gain new knowledge of a selected subject," the spirit of which is "devotion to truth and an insistent longing for better understanding." By formal motion the Advisory Committee recommended that the Division of Agricultural Engineering, U.S.D.A. undertake investigations looking to the establishment of a measure of soil tilth. The effect of the Davidson and Walker reports on research in mechanical farm equipment was stated to have stimulated the work of State experiment stations, as represented by increases in expenditures for agricultural engineering research of about $68,000 for the fiscal year 1928 over 1927 and about the same for 1929 over 1928. The increase in 1929 for the Division of Agricultural Engineering is about $130,000, including funds for terracing experiments in cooperation with the Bureau of Chemistry and Soils; the total appropriations for this Division for 1930 amount to $427,000.

"Irrigation Districts in California" is the title of a 400-page bulletin by Frank Adams that will be issued from the office of the State Engineer of California the latter part of May. It will be published as Bulletin 21 of the Division of Engineering and Irrigation of the California State Department of Public Works.

This bulletin reviews the irrigation district movement in California from its early beginnings, summarizes the various acts of California dealing with districts for irrigation, reclamation, and conservation purposes, and describes in detail the present 89 active and 26 inactive or partially active irrigation districts in the State. Location and boundary maps are included for each of the active districts, together with a number of half-tone cuts illustrative of typical California irrigation district structures and scenes.

The bulletin shows the total area included in active irrigation districts in California to be approximately 3,500,000 acres of which about 3,000,000 acres is irrigable, and about 1,650,000 acres is irrigated. Bonds validated by the State Bond Certification Commission total $111,325,057; bonds outstanding January 1, 1929, $97,289,937; bond principal in default January 1, 1929, $351,000; bond interest in default January 1, 1929, $811,549.

The descriptions of the active irrigation districts in the State each cover eight main sub-heads, viz: history, soils and topography, development, use and delivery of water, water supply, works, bonds and assessments and water tolls. Sufficient detail is given to present a rather complete picture of the physical and economic situation in each district.

Those desiring copies of this publication should apply to the State Engineer, Public Works Building, Sacramento.

R. B. Gray spent two days in Washington, in connection with the manuscript on the low-cutting attachment for corn binders, prepared by Frank Irons, and while here attended the meeting of the Advisory Council on Research in Farm Mechanical Equipment. On his return to Toledo he was asked to help with specifications for equipment to be purchased by the Department for the eradication of the Mediterranean fruit fly which involves the use of machinery. Later he made a week's trip to study corn belt field conditions in their relation to known methods of controlling the corn borer. En route he called on Professor C.O. Reed of Ohio State University at Columbus. He then stopped at Evansville, Indiana, to view the all-in-one plow, a tillage implement invented to take the place of the mould board plow and soil pulverizing tools. While this plow may not meet corn borer control requirements, it appears to have possibilities from a soil tilth standpoint, a very important subject at the present time.

Professor Caesar, Dominion Entomologist, in company with four other Canadians - three of whom were agricultural engineers - spent one day at Toledo discussing methods of controlling the corn borer by mechanical means.

R. M. Merrill spent two days in Urbana with T. Cleaver viewing the progress of the work and discussing matters relating to the cooperative corn borer project with the Farm Mechanics Department of the University of Illinois.

A PROGRESS REPORT ON THE RAKE WORK PERFORMED BY THE TOLEDO ENGINEERS HAS RECENTLY BEEN PREPARED BY S. W. MCBIRNEY AND FORWARDED TO THE WASHINGTON OFFICE.

MESSRS. I. F. REED AND W. R. HUMPHRIES HAVE JUST FINISHED THEIR REPORT ON "HUSKER-SHREDDERS IN CORN BORER CONTROL." FROM THIS MATERIAL A BULLETIN IS BEING PREPARED COVERING CARE AND OPERATION OF HUSKER-SHREDDERS UNDER CORN BORER CONDITIONS.

L. G. SCHOENLEBER, A JUNIOR AGRICULTURAL ENGINEER FROM NEBRASKA REPORTED FOR DUTY AT TOLEDO APRIL 22. A. GLAVES, A JUNIOR AGRICULTURAL ENGINEER, APPOINTED FROM MISSOURI, REPORTED FOR DUTY AT TOLEDO, MAY 1. S. W. MCBIRNEY FROM IDAHO, UNTIL RECENTLY ASSISTANT AGRICULTURAL ENGINEER, RESIGNED HIS POSITION, EFFECTIVE MAY 1.

DURING THE EARLY PART OF MAY, GEORGE R. BOYD SPENT SEVERAL DAYS IN CONNECTICUT COLLABORATING WITH MR. KNIPE OF THE CONNECTICUT AGRICULTURAL COLLEGE IN SOME EXPERIMENTAL TREE POISONING WORK. VARIOUS TYPES OF GROWTH WERE POISONED. MR. KNIPE WILL MAKE PERIODICAL INSPECTIONS AND RECORD THE RESULTS.

D.G. MILLER ATTENDED THE MEETING OF THE NORTHCENTRAL SECTION, AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS, AT FARGO, NORTH DAKOTA, MAY 4 WHERE HE READ A PAPER ON SOIL EROSION AND THE WORK THE DIVISION IS DOING IN THE WAY OF EROSION PREVENTION.

T.A.H. MILLER IS IN TOLEDO, OHIO, SUPERVISING THE ASSEMBLING AND ERECTION OF THE LARGE CORN BORER EMERGENCE CAGES BEING USED BY THE BUREAU OF ENTOMOLOGY IN THEIR STUDIES OF THIS INSECT. EACH OF THESE CAGES COVERS AN ACRE OF GROUND.

J. T. BOWEN LEFT WASHINGTON MAY 7 FOR A TRIP TO POINTS IN THE MIDDLE WEST IN CONNECTION WITH THE STUDY OF DAIRY REFRIGERATION UPON WHICH SUBJECT MR. BOWEN LATER WILL PREPARE A BULLETIN.

COLIN A. TAYLOR REPORTS THAT REGULAR SAMPLING OF THE RAINFALL PENETRATION PLOTS IN THE SANTA ANA RIVER AREA OF SOUTHERN CALIFORNIA WAS CONCLUDED ABOUT APRIL 15 AND THE ROUNDS OF THE GENERAL TEST HOLES STARTED. THE OBJECT HAS BEEN TO GO OVER THE AREA BY CROPS. THE RESULTS FROM THE PEACHES IN THE SANDY AREA SOUTHEAST OF ONTARIO SHOW THE PENETRATION FROM 12 INCHES OF RAIN TO BE 8 FEET. THE BETTER GLASS OF GROVES THAT HAD NOT YET BEEN IRRIGATED THEN SHOWED DRY SOIL FROM 8 FEET TO 15 OR 16 FEET, WHILE THE GROVES IN POOR CONDITION SHOWED NO DRY SOIL INDICATING A SHALLOW ROOT ACTIVITY.

IN TESTING THE EVAPORATION FORMULA DERIVED FROM EXPERIMENTS AT FORT COLLINS, COLO., AND UNDER A WIDE RANGE OF CONDITIONS ELSEWHERE, A COMPARISON WAS MADE BY CARL ROHWER BETWEEN THE EVAPORATION MEASURED AT VARIOUS POINTS IN THE UNITED STATES BY DIFFERENT ORGANIZATIONS AND THE EVAPORATION COMPUTED BY THE FORMULA FROM THE METEOROLOGICAL DATA. TWENTY-TWO SETS OF OBSERVATIONS AT ELEVATIONS FROM 127 TO 9,610 FEET ABOVE SEA LEVEL WERE USED, AND IT WAS FOUND THAT THE MEAN DIFFERENCE BETWEEN THE OBSERVED AND THE COMPUTED EVAPORATION WAS 1.58 PER CENT AND THE MAXIMUM DEVIATION 19.7 PER CENT.

An interesting feature of the Division's work at present is a study of a section of the Des Moines River through the city of Ottumwa, Iowa, for the purpose of determining the efficacy of constructing a cut-off across a bend in the river. The study will be made by means of a model being constructed of that section of the river and of the cut-off, through which water will be passed and actual flow conditions studied. The city of Ottumwa is bearing the expense of the construction of this model.

F. C. Scobey has been invited to deliver a series of lectures at the Summer Session of the University of Southern California.

W.W. McLaughlin visited Oregon, Idaho, and Utah during April for the purpose of inaugurating additional research work and to attend a conference at Ogden on the Bear River Bay Migratory Bird Refuge.

C. E. Ramser has contributed the following with reference to the progress of the soil erosion project near Guthrie, Okla., of which he has charge.

Five sets of terracing experiments have been laid out. One set consists of six terraces 700 feet in length with a uniform fall of 4 inches in 100 feet and vertical interval between terraces of 2, $3\frac{1}{2}$, and 5 feet. The second set of terracing experiments consists of four terraces, 1,500 feet in length and with grades as follows: - level, 2 inches, 4 inches, and 6 inches per hundred feet. The third set of experiments consists of five terraces about one-half mile long, two located on virgin land and three on eroded and gullied land. The grade of two of the terraces on virgin land and two on eroded land are variable. The fourth set of experiments consists of three level terraces mostly on virgin soil and on a land slope of about $2\frac{1}{2}$ feet per 100 feet, two of which encircle the top of a knoll near the center of the farm and the other has both ends closed so that all of the rainfall is caught and held above these terraces until it evaporates or percolates into the soil. The fifth set of experiments consists of ten level terraces varying in length from 200 to 700 feet and with vertical interval varying from 2 to 4 feet.

A series of plots have been laid out on a badly eroded and gullied slope which has been left unterraced, erosion being checked in the gullies by means of brush, rock, and pole dams. The plots are planted to various cover crops which will be plowed under to build up the fertility of the soil.

Since the establishment of the Farm in January, 1929, about $2\frac{1}{2}$ miles of interior fencing have been removed, 350 peach trees have been pulled out by tractor, 15 acres of land has been cleared and partly grubbed; 1,800 feet of gullies have been filled with brush; 75 acres of land have been terraced on which 7 miles of terraces have been constructed; 45 brush dams, 8 rock dams, 4 woven wire dams and 6 pole dams, have been built for checking erosion in gullies; about 100 acres of land have been prepared for crops; and about 20 acres of cotton and 5 acres of sweet clover have been planted.